Digidesign 96i I/O Guide

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Communications & Safety Regulation Information

Compliance Statement
The model 96i complies with the following standards regulating interference and EMC:

- FCC Part 15 Class A
- EN55103 – 1, environment E4
- EN55103 – 2, environment E4
- AS/NZS 3548 Class A

Radio and Television Interference
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.

Communications Statement
This equipment has been tested to comply with the limits for a Class A digital device. Changes or modifications to this product not authorized by Digidesign, Inc., could void the Certification and negate your authority to operate the product. This product was tested for CISPR compliance under conditions that included the use of peripheral devices and shielded cables and connectors between system components. Digidesign recommends the use of shielded cables and connectors between system components to reduce the possibility of causing interference to radios, television sets, and other electronic devices.

Safety Statement
This equipment has been tested to comply with USA and Canadian safety certification in accordance with the specifications of UL Standards; UL1419 and Canadian CSA standard; CSA C22.2 No.1-M90. Digidesign Inc., has been authorized to apply the appropriate UL & CUL mark on its compliant equipment.

Important Safety Instructions
When using electric or electronic equipment, basic precautions should always be followed, including the following:

- Read all instructions before using this equipment.
- To avoid the risk of shock, keep this equipment away from rain water, and other moisture. Do not use this equipment if it is wet.
- The equipment should only be connected to the correct rating power supply as indicated on the product.
- Do not attempt to service the equipment. There are no user-serviceable parts inside. Please refer all servicing to authorized Digidesign personnel.
- Any attempt to service the equipment will expose you to a risk of electric shock, and will void the manufacturer's warranty.
- The product should be connected only to the correct power supply as indicated on the product.

Warning!

- HD audio interfaces need room at their sides to maintain proper air flow and cooling.
- Do not install these units into a rack or other enclosure that doesn't leave room on either side for the unit fans.
- Do not block the sides of the units (where fans are), or disconnect the fan.
- If the units are racked up in a case, remove all lids, doors, or covers before operating the units.
- Failure to do so can result in the units overheating very quickly, which can permanently damage them.

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chapter 1

Introduction to the 96i I/O

The Digidesign 96i I/O is a 16-input, 2-output digital audio interface, featuring 24-bit analog-to-digital (A/D) and digital-to-analog (D/A) converters.

The 96i I/O supports sampling rates up to 96 kHz for superior dynamic range and low noise floor. The 96i I/O is the ideal audio interface to input multiple MIDI sound modules, samplers, synthesizers, and other sound sources into Pro Tools|HD.

96i I/O Features

- 16 discrete input channels and two output channels, with 4-segment LED meters on each channel. Input and output features include:
  - 16 channels of 24-bit, 96 kHz-capable analog input, with adjustable input sensitivity
  - Two channels of 24-bit, 96 kHz-capable analog output, with selectable operating level
  - Two channels of 24-bit, 96 kHz-capable digital S/PDIF RCA input and output
- Loop Sync In and Out
- External Clock In and Out
- Expansion DigiLink port

What's Included

- 96i I/O
- DigiLink cable (1.5 feet [0.46m])
- BNC cable (1.5 foot [0.46m])

System Requirements

The 96i I/O is for Pro Tools|HD systems only, and can be used as the only audio interface in a Pro Tools|HD system (no other audio interface present), or as an expansion I/O with a 192 I/O, 192 Digital I/O, 96 I/O, or other 96i I/O audio interface.

⚠ *The 96i I/O cannot be used in standalone mode (it must be used with a Pro Tools|HD system).*

The 96i I/O does not provide a Legacy port. For more information on connecting the 96i I/O, see Chapter 3, "Installing and Configuring the 96i."

Compatibility Information

Digidesign can only assure compatibility and provide support for hardware and software it has tested and approved. For a list of Digidesign-qualified computers, operating systems, hard drives, and third-party devices, refer to the latest compatibility information on the Digidesign Web site (www.digidesign.com/compato).

Digidesign Registration

Make sure to complete and return the registration card included with your Digidesign audio interface. Registered users will receive periodic software update and upgrade notices. Refer to the registration card for information on technical support.

About this Guide

This guide provides a basic overview of the 96i I/O features and functionality.

Complete instructions for connecting and configuring your Pro Tools|HD-series system are located in the *Getting Started with HD Guide*.

For additional information about using Pro Tools software to route your interface inputs and outputs too Pro Tools inputs and outputs, see the *Pro Tools Reference Guide*.

Conventions Used in This Guide

Digidesign guides use the following conventions to indicate menu choices and key commands:

Convention	Action
File > Save Session	Choose Save Session from the File menu
Control+N	While pressing the Control key, press the N key
Control-click	While pressing the Control key, click the mouse button
Right-click (Windows)	Click with the right mouse button

The following symbols are used to highlight important information:

User Tips are helpful hints for getting the most from your system.

Important Notices include information that could affect your data or the performance of your system.

Shortcuts show you useful keyboard or mouse shortcuts.

Cross References point to related sections in other Digidesign guides.

About www.digidesign.com

The Digidesign Web site (www.digidesign.com) is your best source for information to help you get the most out of your Pro Tools system. The following are just a few of the services and features available.

Support Contact Digidesign Technical Support or Customer Service; download software updates and the latest online manuals; browse the Compatibility documents for system requirements; search the online Answerbase; join the worldwide Pro Tools community on the Digidesign User Conference.

Training and Education Become a certified Pro Tools Operator or Expert; study on your own using courses available online, or find out how you can learn in a classroom setting at a certified Pro Tools Training Center.

Products and Developers Learn about Digidesign products; download demo software; learn about our Development Partners and their plug-ins, applications, and hardware.

News and Events Get the latest news from Digidesign; sign up for a Pro Tools demo.

To learn more about these and other resources available from Digidesign, visit our Web site (www.digidesign.com).

chapter 2

96i I/O Hardware Overview

The 96i I/O Front Panel

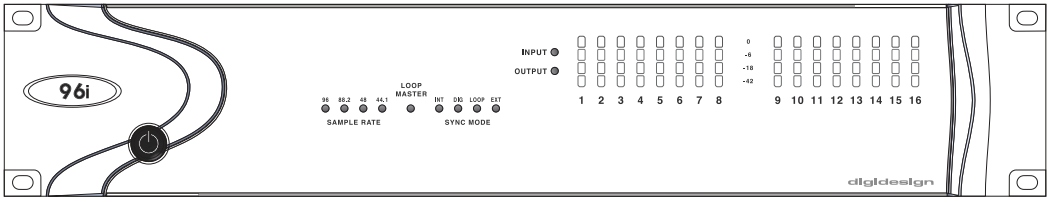


Figure 1. 96i I/O front panel

Power Switch and LED Ring

This button turns the 96i I/O on and off.

The LED ring around the power button will light green to indicate that the unit has powered up successfully and is connected to an active Pro Tools|HD system. If the LED ring is orange, the unit has power, but the computer it is connected to is shut down.

Sample Rate LEDs

These LEDs display the current Pro Tools sample rate, either 96 kHz, 88.2 kHz, 48 kHz, or 44.1 kHz. (The 96i I/O will go offline whenever the current Pro Tools sample rate is 176.4 kHz or 192 kHz.)

Loop Master LED

The LOOP MASTER LED indicates which HD audio interface is the master Pro Tools peripheral. Loop Master defaults to the first HD I/O connected to the HD Core card. Loop Master will always be lit in systems with a single interface.

In expanded systems, only one HD I/O can be Loop Master at a time. When you change the clock source to an external clock on a particular HD I/O or a SYNC I/O, that HD I/O (or SYNC I/O) will automatically become the Loop Master and all other HD I/Os in the chain will be switched to Loop Slave mode (see “Sync Mode LEDs” on page 6).

Sync Mode LEDs

The SYNC MODE LEDs indicate the current Pro Tools Clock Source and Sync mode. Choices include the following:

INT (Internal) Indicates the 96i I/O is the Pro Tools clock master.

DIG (Digital) Indicates the 96i I/O S/PDIF port is providing master clock to Pro Tools.

LOOP (Loop Sync) Indicates 96i I/O is in Loop Slave mode, and is clocking to the current Loop Master device. See also "Loop Master LED" on page 5.

EXT (External) Indicates the 96i I/O EXT CLOCK IN port is providing master clock to Pro Tools.

For more information, see the *Getting Started with HD Guide*.

Input and Output LEDs and Meters

16 sets of four-segment LEDs indicate signal level for each of the 96i I/O input channels.

These LEDs are calibrated at –42 dB, –18 dB, –6 dB, and 0 dB, respectively, referenced to Full Scale digital.

Full Scale digital (0 dBFS) does not always indicate signal clipping levels; please use the on-screen meters in Pro Tools to determine whether a signal is clipping. For more information, see the Getting Started Guide with HD Guide.

Two additional LEDs, located to the left of the meters, indicate whether the meters display input or output levels; the meters indicate input levels by default, and can be switched from within the Hardware Setup dialog in Pro Tools.

96i I/O Back Panel

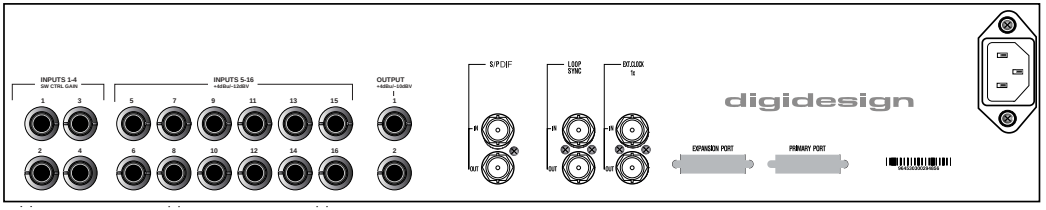


Figure 2. 96i I/O back panel

Analog Inputs

96i I/O provides 16 balanced, 1/4-inch TRS jacks for analog audio input connections.

- Inputs 1–4 provide six stages of software-adjustable operating level sensitivity. Choices range from –12.0 dBV to +4.0 dBu, with default sensitivity set to –8 dBV.
- Inputs 5–16 are software-switchable between –8 dBV and +4 dBu operating level sensitivity.

The 96i I/O inputs can accommodate a wide range of line-level devices including synthesizers, samplers, sound modules, and effects devices.

All analog inputs are balanced, and feature 24-bit, 96 kHz analog-to-digital converters, with 14 dB of headroom above +4 dBu (fixed, requiring no calibration). Unbalanced connections are supported with the use of standard 1/4-inch mono phone plugs.

96i I/O input wiring for balanced connections

Tip	Hot (or +)
Ring	Cold (or –)
Sleeve	ground

Analog Outputs

These are balanced, 1/4-inch TRS jacks for analog audio output connections.

The 96i I/O analog outputs feature 24-bit digital-to-analog converters. Output operating levels are software-switchable between +4 dBu and –10 dBV operating levels.

The 96i I/O is factory calibrated at +14 dB headroom, yielding a maximum output level of +18 dBu when in +4 dBu operating mode. When set to –10 dBV operating mode, maximum output level is +4 dBV.

Unbalanced connections are supported through the use of standard 1/4-inch TRS mono phone plugs.

96i I/O output wiring for balanced connections

Tip	Hot (or +)
Ring	Cold (or –)
Sleeve	ground

S/PDIF Digital In and Out

These are unbalanced RCA jacks that accept and output a stereo S/PDIF digital data stream. S/PDIF supports up to 24-bit audio at up to 96 kHz.

S/PDIF input can be chosen as the input source for channels 1–2 in the Hardware Setup dialog. S/PDIF output is mirrored to analog outputs 1–2.

To maintain data integrity and minimize jitter, use only 75-ohm coaxial cable.

Loop Sync In and Out

Loop Sync is a dedicated Pro Tools clock loop for synchronizing multiple HD-series interfaces together. The Loop Sync In and Out ports are standard BNC connectors that output a 1x Loop Sync clock signal. Loop Sync should only be used to chain multiple HD-series peripherals together.

Loop Sync uses a word clock signal based on sampling rates of either 44.1 kHz or 48 kHz. As sample rates increase in the system, Loop Sync continues to operate at a base rate of 44.1 kHz or 48 kHz (44.1 kHz for 88.2 kHz sessions, 48 kHz for 96 kHz sessions).

EXT. CLOCK In and Out

The External Clock I/O ports are standard BNC connectors that receive and output a word clock signal. These ports can be used to synchronize the 96i I/O to any device that requires (or provides) word clock.

The External Clock In and Out are configured in the Hardware Setup dialog.

Because the Loop Sync and Word Clock ports pass crucial timing information, you must use high-quality 75-ohm coaxial cables for making connections. RG59 or better quality cable is recommended

Primary Port

The Primary Port is used to connect the 96i I/O to your HD cards, or to another HD-series audio interface, using a DigiLink cable. When the 96i I/O is the only audio interface in the system, the Primary Port is connected directly to the HD Core card. When 96i I/O is used as an additional I/O in an expanded Pro Tools|HD system, the 96i I/O Primary Port can be connected to an HD Accel Card or HD Process Card, or to the Expansion port on a 192 I/O, 192 Digital I/O, or 96 I/O. (For more information, see Chapter 3, “Installing and Configuring the 96i.”)

Expansion Port

The Expansion Port is used to connect an additional HD-series I/O to the 96i I/O. Using a DigiLink cable (one is included with each HD-series interface), another 96i I/O can be connected to the Expansion port for an additional 16 channels of input to your HD Core card (or other).

AC Power

This connector accepts a standard AC power cable. The 96i I/O is auto power-selecting (100V to 240V) and will automatically work with a standard modular cable to connect to AC power receptacles in any country.

chapter 3

Installing and Configuring the 96i

This chapter provides basic instructions for installing a 96i I/O, and configuring its operating levels.

See the Getting Started with HD Guide for complete system installation and configuration instructions.

If you are adding the 96i I/O to an existing system, see the Expanded Systems Guide.

Installing the 96i

All installations require the following AC power and DigiLink connections. Expanded systems also require Loop Sync connections.

Before You Begin

Turn off your computer, hardware interfaces, monitoring system, hard drives, and peripherals. Making connections while power is on can damage your system.

Power

To connect AC power to the 96i:

■ Using the AC power cable included with the unit, connect the 96i I/O to a standard AC power receptacle. The 96i I/O is auto power-selecting (100V to 240V) and will work automatically when plugged into an AC power receptacle in any country.

DigiLink Connections

DigiLink connections differ depending on whether the 96i I/O is the primary audio interface in the system, or if it is being added as an expansion I/O to an existing HD system.

To connect the 96i I/O as the primary interface in a Pro Tools|HD system:

1 Connect one end of the included DigiLink cable to the Primary Port on the 96i I/O.

2 Connect the other end of the DigiLink cable to the DigiLink port on the HD Core card. (See the *Getting Started with HD Guide* for complete installation instructions.)

To connect the 96i I/O to an existing Pro Tools|HD-series system:

1 Connect one end of a DigiLink cable to the Primary Port of the 96i I/O.

2 Connect the other end of the DigiLink cable to one of the following:

- An available DigiLink port on an HD Accel or HD Process card.

– or –

- An available Expansion Port on the existing HD I/O.

⚠ *If you have at least one 192 I/O or 192 Digital I/O in your system configuration, it must be the primary audio interface and Loop Sync master.*

For additional information, see the Expanded Systems Guide

Loop Sync Connections

(For Expanded Systems Only)

Loop Sync must be connected whenever multiple HD-series audio interfaces are present in a system. (If the 96i I/O is the only audio interface present, skip this section and proceed to "Powering Up Your System" on page 10.)

To connect Loop Sync between two or more HD-series audio interfaces:

1 Connect the BNC cable from the Loop Sync Out port of the primary HD I/O (192 I/O, 192 Digital I/O, 96 I/O, or other 96i I/O) to the Loop Sync In port of the 96i I/O.

2 Connect the Loop Sync Out of the 96i I/O to the Loop Sync In of the primary HD I/O (if using only two interfaces), or to the Loop Sync In of the next HD I/O if using more than two.

3 If using more than two HD I/Os, repeat for additional interfaces and finish by connecting the Loop Sync Out of the last interface to the Loop Sync In of the primary interface to complete the Loop Sync chain.

📄 *See the Getting Started with HD Guide for more information about Loop Sync.*

Powering Up Your System

In order for Pro Tools to communicate properly with audio interfaces and other peripherals, it is important that you start up and shut down your system in the following order:

Power up your system in this order:

1 Turn on your Pro Tools hard drives.

2 Turn on synchronization or other MIDI peripherals or interfaces.

3 Turn on your 96i I/O and any other Pro Tools audio interfaces. On power up, the status LEDs will flash. Wait at least fifteen seconds for the 96i I/O to initialize, and the status LEDs to stop blinking. If properly connected, the ring around the power switch will be orange while the computer is powered down.

4 Turn on your computer. All power LED rings on HD I/O should switch to green. This signifies that the HD I/Os are properly connected.

Power down your system in this order:

1 Quit Pro Tools.

2 Shut down the computer.

3 Power off your audio interfaces.

4 Turn off any synchronization, MIDI, or other peripherals or interfaces.

5 Turn off your drives.

Checking Installation

This section explains how to quickly check that your installation was successful.

To check installation using DigiTest:

1 Start up your computer (see "Powering Up Your System" on page 10).

2 Launch DigiTest.

3 Ensure that any and all HD cards and HD I/Os are identified properly. If not, see the *Getting Started with HD Guide*.

4 When finished, quit DigiTest and restart.

To check or reconfigure I/O:

1 Launch Pro Tools and choose Setup > Hardware Setup.

2 Use the Identify button to verify that your newly-added 96i I/O has been properly identified. Select each HD I/O in the Peripherals list, and click on the Identify radio box in the lower left corner of the Hardware Setup dialog to illuminate all of the LEDs on the front panel. This will clearly demonstrate which HD I/O you have selected in the Peripherals list.

3 If you encounter any difficulties, power down the computer completely, and turn off all interfaces. Check all AC power, DigiLink, Loop Sync, and audio connections. Then turn the power back on all interfaces and boot the computer. See "Powering Up Your System" on page 10 for more information.

Audio Connections

The diagrams below provide suggestions for connecting studio gear to your system. Figure 1 illustrates a setup without a mixer, where effects processors and monitoring gear are connected directly to the 96i I/O. Figure 2 illustrates a studio setup with the 96i I/O connected to a mixing console, with effects and other gear routed into the console as well.

The 96i I/O supports hardware inserts on channels 1–2 only. Because this uses both output channels, you should only use the 96i I/O for hardware inserts when another HD-series I/O is present (otherwise you will not be able to monitor your work when outputs 1–2 are in use for insert returns).

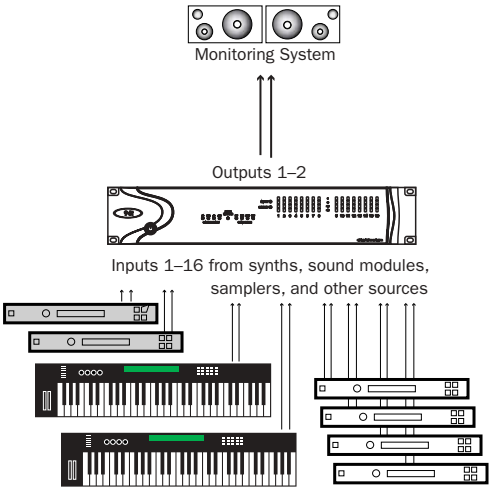


Figure 1. 96i I/O studio setup without a mixing console

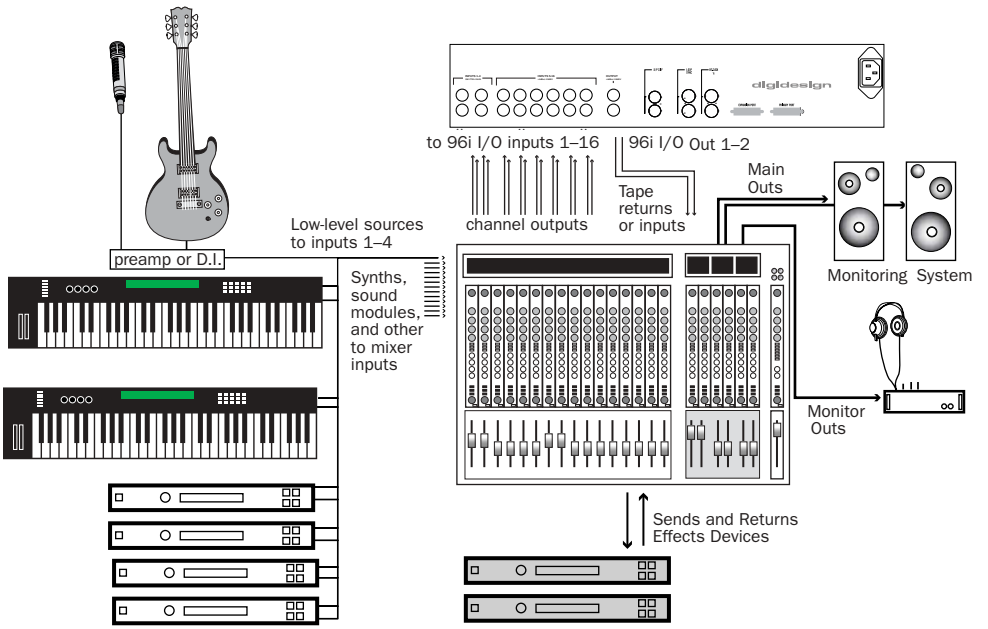


Figure 2. 96i I/O studio setup with a mixing console

Connection Tips

◆ Connect digital recorders such as CD and DAT recorders using the S/PDIF RCA outputs on the 96i I/O.

◆ Inputs 1–4 offer the greatest amount of sensitivity adjustment, so use these inputs for low-level signals from less powerful devices (such as older keyboards, samplers, and sound modules).

◆ Use inputs 5–16 for professional grade devices with higher output levels.

◆ Consider connecting the 96i I/O to a high-quality patch bay for the greatest flexibility. A patch bay will let you quickly route signals to inputs 1–4 or 5–16 as needed; use inputs 1–4 when you need the most control over input levels. Use inputs 5–16 for all other input needs.

Configuring the 96i I/O in Pro Tools

Configuring the 96i I/O with Pro Tools includes adjusting input and output gain, and selecting (or deselecting) S/PDIF input.

The 96i I/O, when correctly connected, is automatically recognized by Pro Tools when it launches. 96i I/O settings are configured in the Hardware Setup window.

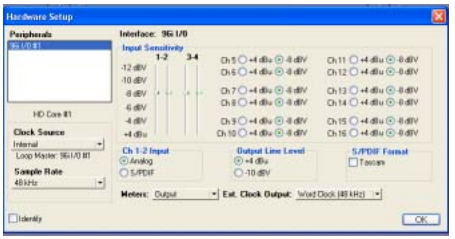
To configure the 96i I/O in Pro Tools:

1 Choose Setups > Hardware.

2 Configure the Hardware Setup parameters for the 96i I/O.

- For input gain, see "Adjusting 96i I/O Input and Output Levels" on page 13.

- For analog/digital input switching, see "Enabling S/PDIF Digital Input for Channels 1 and 2" on page 13.



Hardware Setup controls for the 96i I/O

Adjusting 96i I/O Input and Output Levels

Input Levels

The 96i I/O input levels are adjustable in Pro Tools. Inputs 1–4 provide multi-level sensitivity adjustment. Inputs 5–16 provide two selectable settings. The available settings let the 96i I/O accommodate a variety of equipment output levels.

To adjust input level sensitivity on the 96i I/O:

1 Connect instrument and other devices to the 96i I/O analog inputs.

2 In Pro Tools, choose Setups > Hardware.

3 Choose 96i I/O in the Peripherals list.

4 For Inputs 1–4, set the input trim slider to match the output level of the connected instrument. Choices range from –12 dBV to +4 dBu. (Hardware inputs and outputs are muted whenever the Hardware Setup window is open. Check your settings by closing the Hardware Setup window and then playing the input source. Return to the Hardware Setup window if further adjustments are needed.)

5 For each input or pair of inputs 5–16 being used, select –8 dBV or +4 dBu as appropriate to best match the output level of the connected devices.

6 Click Done.

Output Levels

The 96i I/O analog outputs can operate at –10 dBV or +4 dBu, as configured in the Hardware Setup dialog.

Analog output is mirrored to S/PDIF outputs 1–2, making it easy to connect CD, DAT, and other stereo digital recorders that support RCA S/PDIF input.

To set Output operating level:

■ In the Hardware Setup dialog, choose the 96i I/O in the Peripherals list, then select –10 dBV or +4 dBu, as desired.

Enabling S/PDIF Digital Input for Channels 1 and 2

You can choose to use either the analog or digital inputs as sources for 96i I/O channels 1–2. Only channels 1–2 can access the S/PDIF inputs.

To select analog or digital input for channels 1–2:

1 Choose Setups > Hardware.

2 Choose 96i I/O in the Peripherals list.

3 Click to set Ch 1–2 Input to Analog or S/PDIF, as appropriate.

96i I/O and I/O Setup Guidelines

The 96i I/O only supports analog and digital switching for channels 1–2, from within the Hardware Setup and I/O Setup dialogs. The 96i I/O does not support path remapping within I/O Setup.

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